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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,174	03/23/2004	Mariappan P. Paranthaman	1323	7770

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EXAMINER	
VIJAYAKUMAR, KALLAMBELLA M	
ART UNIT	PAPER NUMBER
1793	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,174	PARANTHAMAN ET AL.	
	Examiner	Art Unit	
	KALLAMBELLA VIJAYAKUMAR	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *52-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *52-54* is/are allowed.

6)☒ Claim(s) *55-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/03/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Claims 1-51 cancelled. New Claims 52-60 added. Claims 52-60 as amended are currently pending with the application.
- The information disclosure statement (IDS) submitted on 04/03/2008 is in compliance with the provisions of 37 CFR 1.97, and it has been considered by the examiner.
- Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection. The amendment overcomes the claim objections and claim rejections and the ODP rejections cited in the last office action. Applicants are correct in that the previously cited references do not teach or suggestive of the claimed buffers layers of La0.7Ca0.3MnO3, LaCoO3, La0.5Sr0.5TiO3, and La2CuO4 (Res, Pg-5, Last Para; Pg-6, Para 1-2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 55-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore et al (WO 01/83855 A1) in view of Schoop et al (US 6,537,689) and Fritzemeier et al (US 6,428,635).

The US 2004/0033904 is being used as equivalent of WO 01/83855 in this rejection.

Moore et al (US-904) teach a metal article coated with a metal layer having a biaxially textured surface, which process comprises electrodepositing the metal layer on a biaxially textured metal substrate such that the surface of the metal layer has the same texture as that of the substrate (Abstract), and with high transport critical densities (P-0002). The substrates were cube textured metals and alloys based on Ag, Cu, **Ni** or Fe (P-0031) such as Ni-Cr and Ni-Fe (P0015). The buffer layer/intermediate oxygen barrier layer was epitaxially electrodeposited metal or a mixture of metals such as Cr, Ni, Pd, Pt, Ru, Os, Rh, **Ir,** Au or Cu or mixtures thereof (P-0016), and a multiple oxygen barrier layer such as Ru, Os, Rh, **Ir,** Pd, Pt or Au or a mixture thereof (P-0017), deposited between Ni substrate and Ag layer (P-0020-0021, 0034). A typical article configuration comprised two or more buffer/barrier layers forming the template of biaxially textured metallic substrate with a configuration such as Ni/Pt-Pd-Ir/Ag-Ag2O/ceramic-CeO2-MgO-YSZ/YBCO (P-0003, 0005). The ceramics forming buffer layer/s were YSZ, MgO, TiN, ZrO2, CeO2, LaAlO3 and SrTiO3 (P-0006). The epitaxial superconductor layer was deposited over the buffer layers (P-0002, 0051-52).

The prior art fails to teach the specific buffer layer per claims 55 and 58, and the multiple buffer layers per claims 56-57 and 59-60.

In the analogous art, Schoop et al teach a multilayer superconducting article with high critical densities comprising a biaxially textured metallic-substrate comprising alloys of Ni, Cu, Fe, Al, Ag and Pd (Abstract; Cl-10, Ln 19-21; Cl-11, Ln 2-5), an epitaxial intermediate layer such as Ni, Au, Ag, Pd and alloys overlying a surface of the substrate (Cl-11, Ln 31-39; 59-61), and epitaxial buffer layer/s comprising MgO, YSZ, Y2O3, LaMnO3, $La_{0.66}Ca_{0.33}MnO_3$, $La_{0.66}Sr_{0.33}MnO_3$, $La_{0.66}Ba_{0.33}MnO_3$ and Ag (Cl-36, Ln 13-18) overlying the intermediate layer. The superconductor layer overlying the buffer layer comprised an epitaxial film of REBCO (Cl-20, Ln 61-65). A typical superconductor article configuration included YBCO/CeO2/YSZ/CeO2/Ni (Cl-26-27, Example-II).

In the analogous art, Fritzemeier et al teach a superconductor article comprising a biaxially textured Ni-Cu-alloy substrate, a buffer layer system and a YBCO layer (Abstract, Fig 3, 3A and 3B; Cl-2, Ln 41-43). The structure included a substrate 301 of composite 300, for receiving a superconducting oxide coating 303, a buffer layer (or multiple buffer layers) 302 is deposited in an epitaxial process onto the cube-textured alloy substrate 301 (Fig-3). The buffer layer 302 includes a single metal or oxide layer, or can be a multiple layered structure. The multiple layers 304 and 305 (Fig-3A) can include any combination of layers, such as a metal layer 304 with an oxide layer 305 on top, or an oxide layer 304 with another oxide layer 305 on top or, the buffer layer can include three or even more layers (Fig-3B) before deposition of the superconducting layer 303 (Cl-4, Ln 24-43; Cl-6, Ln 41-65). The top and buffer layers included noble metals including Iridium and the oxide buffer layers included stable oxides with a cubic structure such as MgO, Al2O3, yttria, YSZ, or rare earth oxides such as CeO2, Yb2O3 etc. or mixtures of these oxides (Cl-7, Ln 16-26).

It would be obvious to a person of ordinary skilled in the art to formulate the multilayer superconductor article of Moore et al by substituting oxide/ceramic buffer layer with $La_{0.66}Ca_{0.33}MnO_3$ oxide buffer layer selected from a short list of buffer materials by Schoop et al as functional equivalent with predictable results and reasonable expectation of success, because the teachings are in the analogous art of multilayer super conductor article comprising biaxially textured metal substrate, and a small genus of buffer/intermediate layers containing species of $La_{0.66}Ca_{0.33}MnO_3$ by Schoop encompasses the species of buffer layers by Moore making them equivalents. The composition of $La_{0.66}Ca_{0.33}MnO_3$ lies close to the instant claimed $La_{0.7}Ca_{0.3}MnO_3$, and similarly, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). This further meets the limitation of a substrate comprising biaxially textured Ir in claim-58.

With regard to claims 56-57 and 59-60, formation of multiple buffer layers would have been obvious to a person of ordinary skilled in the art because Moore et al is suggestive of superconductor article having two or more buffer/barrier layers over biaxially textured Ni alloy substrates (P-0003) and multiple buffer layers are well known in the art as taught by Fritzemeier et al.

2. Claims 55-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore et al (US 2004/0033904) in view of Schoop et al (US 6,537,689) and Fritzemeier et al (US 6,428,635).

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18) overlying the intermediate layer. The superconductor layer overlying the buffer layer comprised an epitaxial film of REBCO (Cl-20, Ln 61-65). A typical superconductor article configuration included YBCO/CeO2/YSZ/CeO2/Ni (Cl-26-27, Example-II).

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It would be obvious to a person of ordinary skilled in the art to formulate the multilayer superconductor article of Moore et al by substituting oxide/ceramic buffer layer with $La_{0.66}Ca_{0.33}MnO_3$ oxide buffer layer selected from a short list of buffer materials by Schoop et al as functional equivalent with predictable results and reasonable expectation of success, because the teachings are in the analogous art of multilayer super conductor article comprising biaxially textured metal substrate, and a small genus of buffer/intermediate layers containing species of $La_{0.66}Ca_{0.33}MnO_3$ by Schoop encompasses the species of buffer layers by Moore making them equivalents. The composition of $La_{0.66}Ca_{0.33}MnO_3$ lies close to the instant claimed $La_{0.7}Ca_{0.3}MnO_3$, and similarly, a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium"

as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). This further meets the limitation of a substrate comprising biaxially textured Ir in claim-58.

With regard to claims 56-57 and 59-60, formation of multiple buffer layers would have been obvious to a person of ordinary skilled in the art because Moore et al is suggestive of superconductor article having two or more buffer/barrier layers over biaxially textured Ni alloy substrates (P-0003) and multiple buffer layers are well known in the art as taught by Fritzemeier et al.

3. Claims 58-60 are rejected under 35 U.S.C. 103(a) as being obvious over Chen et al (US 2004/0157747) in view of either Paranthaman et al (US 6,617,283) or Balachandran et al (US 6,361,598).

Chen et al teach the structure of a multilayer superconductor article comprising a biaxially textured metallically ordered metallic substrate, atomically ordered buffer layer of doped cerium oxide deposited over the substrate surface, and an epitaxial HTS film overlying the buffer layer (P-0034). Substrates included base metals such as **Ni** and noble metal such as Pt, Rh, Ru, Pd, Au, Ag, **Ir and their alloys** (P-0035), and high Jc (Fig-8; 0005). The buffer layer(s) included CGO, Sm2O3, Y2O3, Gd2O3, Pr2O3, CaO, SrO or their mixtures (P-0018, 0036,) and superconductor layer included YBCO (P-0037), wherein lattice parameters for the substrate and HTS are matched reducing the layer cracking (Abstract).

In the analogous art, Paranthaman et al teach a multilayered article with the configuration YBCO/CeO2/YSZ/LSMO/Ni that is crack-free with aligned grains, and has high Jc (Abstract; Cl-2, Ln 6-14). The substrate included biaxially textured Cu, Cu-alloys, Co, Mo, Cd, **Pt, Pd, Ag**, Al **Ni** and Ni-alloys (Cl-3, Ln 43-49). The buffer layer overlying the substrate is an epitaxial layer with the formula $La_{1-x}A_xMnO_3$, wherein $0 \leq x \leq 0.8$, wherein A-Sr, Ba, Ca; and a specific composition included $La_{0.7}Sr_{0.3}MnO_3$ (Cl-3, Ln 23-31). The composition of $La_{0.7}Ca_{0.3}MnO_3$ would have been obvious because the prior art teaches the substitution of Sr with Ca. The multilayer architecture included epitaxial capping/buffer/interlayers of SRO, LNO, YSZ, CeO2 or Y2O3 (Abstract, Cl-4, Ln 10-13; Cl-9, Ln 11-32).

In the analogous art Balachandran et al teach a high temperature multilayer article comprising a biaxially textured **Ni**-alloy substrate, an epitaxial in-plane aligned buffer layer of MgO, STO, SRO, YSZ and/or La_2CuO_4, and an overlying layer of a superconductor (Cl-3, Ln 63 - Cl-4, Ln 24; Cl-1, Ln 49-52).

It would be obvious to a person of ordinary skilled in the art formulate the multilayer superconductor article of Chen et al by substituting oxide/ceramic buffer layer with either $La_{0.7}Ca_{0.3}MnO_3$ oxide by Paranthaman et al or La_2CuO_4 by Balachandran et al selected individually from a small group of buffer materials taught by prior arts respectively, as functional equivalent with predictable results and reasonable expectation of success, because the teachings are in the analogous art of multilayer super conductor article comprising biaxially textured metallic substrate, and small genus buffer materials containing species of either $La_{0.7}Ca_{0.3}MnO_3$ by Paranthaman or La_2CuO_4 by Balachandran et al respectively are encompass the species of buffer layers by Moore making them equivalents.

Allowable Subject Matter

Claims 52-54 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither teaches nor fairly suggest a multilayer superconducting article comprising a combination of specific configuration, structure and composition.

Claims 14, 21 and 29 were indicated to be allowable in the last office action. The claim-52 contains the limitations of original claims 1, 10, 13 and 14. Claims 53-54 are supported by the original claims 17, 21, 25 and 29. An updated search did not result in a new prior art that either teaches or fairly suggest a multi-layered/laminated superconducting article containing the combination of Applicants configuration, structure and composition.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KALLAMBELLA VIJAYAKUMAR whose telephone number is (571)272-1324. The examiner can normally be reached on M-F 07-3.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 5712721358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
June 24, 2008.

/Stuart Hendrickson/
Primary Examiner, Art Unit 1793